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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,020	12/27/2001	Ralph H. Johnson	V637-02670 US	6112

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EXAMINER

NGUYEN, TUAN M

ART UNIT PAPER NUMBER

2828

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/026,020

Applicant(s)

JOHNSON, RALPH H.

Examiner

Tuan M Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-44 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.



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TECHNOLOGY CENTER 2800**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 6) ☐ Other: _____

DETAILED ACTION

Double Patenting

1. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

2. A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

3. Claims 1-44 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-59 of copending Application No. 10/026044, claims 1-6 of copending Application No. 10/026055 and claims 1-34 of copending Application No. 10/026016 . This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

4. The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: Claim 1 of application number 10/026020 recite a VCSEL comprising at least one quantum well having a depth of at least 40 meV and comprised of InGaAsSb. Claims 1, 37 and 48 of copending application number 10/026044 recites a VCSEL comprising at least one quantum well having a depth of at least 40 meV and comprised of GaAsSb, GaAsSbN. Further claim 48 of copending application number 10/026044 recites an AlGaAs confinement layers sandwiching said barrier layers. The limitation in claim 1 of this application is basically

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the same as the limitation in claims 1, 37 and 48 of the copending application 10/026044. The claim recites alternative substitution elements such as Al, In, N with the basic material GaAs. Therefore claims 1-44 and claims 1-59 of copending application 10/026044 are considered as the “same invention”. Furthermore, the substituted elements are disclosed in each application specification and title of the invention. Thus, the claims are not patentable distinct from each other.

5. The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: Claim 1 of application number 10/026020 recite a VCSEL comprising at least one quantum well having a depth of at least 40 meV and comprised of InGaAsSb. Claims 1, 3 and 5 of copending application number 10/026055 recites a VCSEL comprising at least one quantum well having a depth of at least 40 meV and comprised of InGaAs; GaAsN barrier layers and GaAsN confinement layers. Further claim 3 of copending application number 10/026055 recites an AlGaAs confinement layers sandwiching said barrier layers and claim 5 recites AlGaAs barrier layers. The limitation in claim 1 of this application is basically the same as the limitation in claims 1, 3 and 5 of the copending application 10/026055. The claim recites alternative substitution elements such as Al, In, N with the basic material GaAs. Therefore claims 1-44 and claims 1-6 of copending application 10/026055 are considered as the “same invention”. Furthermore, the substituted elements are disclosed in each application specification and title of the invention. Thus, the claims are not patentable distinct from each other.

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6. The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: Claim 1 of application number 10/026020 recite a VCSEL comprising at least one quantum well having a depth of at least 40 meV and comprised of InGaAsSb. Claims 1, 25 and 33 of copending application number 10/026016 recites a VCSEL comprising at least one quantum well having a depth of at least 40 meV and comprised of InGaAsSbN. Further claim 25 of copending application number 10/026016 recites an AlGaAs confinement layers sandwiching said barrier layers and claim 33 recites AlGaAs barrier layers. The limitation in claim 1 of this application is basically the same as the limitation in claims 1, 25 and 33 of the copending application 10/026016. The claim recites alternative substitution elements such as Al, In, N, Sb with the basic material GaAs. Therefore claims 1-44 and claims 1-34 of copending application 10/026016 are considered as the "same invention". Furthermore, the substituted elements are disclosed in each application specification and title of the invention. Thus, the claims are not patentable distinct from each other.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 1-44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding to claim 1, claim recites a VCSEL comprising at least one quantum well having a depth of at least 40 meV and comprised of InGaAsSb; barrier layers sandwiching said at least one quantum well and confinement layers sandwiching barrier. The claim fails to provide any structure and structural relationship in order to support the vertical cavity surface emitting laser which render the claim confusing, vague and indefinite.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Enlash et al (5,251,225).

With respect to claim 1, Eglash et al discloses the fabricated multiple quantum well (MQW) structure (10) comprising the GaInAsSb quantum well lasers (20), barrier layers (22) sandwiching said at least one quantum well, the claddings (14, 16) is consider as the confinement layers sandwiching the barrier layers (22). Eglash et al also discloses the structure has excellent surface morphology without any haze or crosshatch patterns, and with only a small density of oval defects. Photoluminescence spectra emitted at 4.5 and 300k were measured using excitation

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by 647 nm radiation from a Kr ion laser. At 4.5 K there is a single, intense peak at 1.88 μm with full width at half-maximum of 11 meV. At 300K, the peak is somewhat broader, weaker and shifted to 2.11 μm , note col.2 line 59 to col. 3 line 67, see fig. 1.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 2 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eglash et al (5,251,225) in view of Spruytte et al (US 2002/0075920).

With respect to claim 2, Eglash discloses all limitations as set forth in the claim 1 except for the barrier layers are comprises of GaAsN. Whereas Spruytte et al discloses the barrier layers are comprises of GaAs, note col. 2. For the advantageous of quantum well structure having the barrier layers comprises of GaAsN, it would have been obvious to one having ordinary skill in

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the art at the time the invention was made to provide Eglash with the GaAsN barrier layers as taught or suggested by Spruytte.

With respect to claims 7 and 9, Spruytte discloses the confinement layers are comprises of AlGaAs, note col. 1.

With respect to claims 8 and 10, Eglash discloses the quantum well is 50 Å, note col. 9.

12. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eglash et al (5,251,225) in view of Arakawa et al (5,757,833).

With respect to claim 5, Eglash et al discloses all limitations as set forth in the claim 1 except for the confinement layers are comprised of AlGaAs. Whereas Arakawa et al discloses the AlGaAs may of course be used for the cladding layers, note col. 12. For the advantageous of quantum well structure having confinement layers sandwiching the barrier layers, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Eglash with the confinement layers are comprised of AlGaAs as taught or suggested by Arakawa.

With respect to claim 6, Eglash et al discloses the thickness of quantum well layers is 10 nm, note col. 9.

13. Claims 3-4, 11-14, 29-30, 33-38 and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eglash et al (5,251,225) in view of Jewell et al (6,359,920).

With respect to claim 3, Eglash discloses all limitations as set forth in the claim 1 except for the barrier layers are comprises of GaAsP. Whereas Jewell et al discloses the barrier layers

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are comprises of GaAsP, note col. 25. For the advantageous of quantum well structure having the barrier layers comprises of GaAsP, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Eglash with the GaAsP barrier layers as taught or suggested by Jewell.

With respect to claims 4 and 11, Jewell et al discloses the barrier layers are comprises of AlGaAs, note col. 29.

With respect to claims 12 and 14 Eglash discloses the quantum well is up to and including 50 Å, note col. 9.

With respect to claim 13, Jewell discloses the quantum well comprises N. However the percentage of N less than 1%. Since it has been held that discovering an optimum value of a result effect variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to claim 29, Jewell et al discloses the at least one quantum well comprises N, note col. 27.

With respect to claims 30, 34, 36, 38, 42, and 44, Jewell discloses the quantum well is up to 50 Å in thickness, note col. 25.

With respect to claim 33, Jewell discloses the barrier layers are comprises of GaAsP, note col. 25.

With respect to claim 35, Jewell discloses the barrier layers are comprises of AlGaAs, note col. 29.

With respect to claims 37, 41 and 43, Jewell discloses the confinement layers are comprises of AlGaAs, note col. 35.

14. Claims 15-28, 31-32 and 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eglash et al (5,251,225) in view of Jewell et al (6,359,920) further in view of Spruytte et al (US 2002/0075920).

With respect to claims 15 and 31, Eglash and Jewell disclose all limitations as set forth in claims 1 and 13 except for the barriers are comprise of GaAsN. Whereas Spruytte discloses the barriers are comprise of GaAsN, note col. 2. For the advantageous of quantum well structure having the barrier layers comprises of GaAsN, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Eglash with the GaAsN barrier layers as taught or suggested by Spruytte.

With respect to claims 16, 18, 20, 22, 24, 26, 28 , 32 and 40, Eglash discloses the quantum well is up to including 50 Å, note col. 9.

With respect to claim 17, Jewell discloses the barrier layers comprises of GaAsP, note col. 25.

With respect to claim 19, Jewell discloses the barrier layers comprises of AlGaAs, note col. 29.

With respect to claims 21, 23, 25 and 27, Spruytte discloses the confinement layers are comprised of AlGaAs, note col. 1.

With respect to claim 39, Jewell discloses the confinement layers are comprised of AlGaAs, note col. 35.

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Citation Of The Pertinent References

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The patent to Botez et al (US patent 6,363,029) discloses narrow spectral width high power distributed feedback semiconductor laser.

The patent to Brown et al (US patent 5,583,351) discloses color display/detector.

The patent to Van de Walle et al (US patent 5,383,211) discloses TM-polarized laser emitter using III-V alloy with nitrogen.


Communication Information

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan M Nguyen whose telephone number is (703) 306-0247.

The examiner can normally be reached on 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 306-5511 for regular communications and (703) 306-5511 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3329.


Paul Ip
SPE
Art unit 2828

TMN
December 2, 2002